and six feet deep on the outskirts of San Juan. Whether lava engulfs the town is a race between the ability of this valley to hold lava without spilling and the continued outpouring from the volcano. Strangely enough, this new flow comes from the southern side of the volcano, which is the far side from the threatened town. The new stream of liquid and hot rock curves around old flows which engulfed the little village of Paricutin last year.

Eruption of the volcano itself is at present somewhat subdued, probably due to the effort of ejecting lava, but it still erupts every nine to ten seconds.

"Explosions occur very deep within the crater and vapors of explosions issue from the crater's mouth, with noises like waves breaking against a rocky shore," Senor Ordonez reported in Mexico City, where he was trying to arrange government assistance for the Indian population facing eviction by the flow.

Senor Ordonez and his observers, constantly at the volcano's side day and night, are watching and recording what happens as carefully as they did in the weeks just after the volcano was born out of a cornfield on Feb. 20, 1943—first such event to be witnessed by human beings during recorded history.

Even if the lava fails to invade the town, the countryside for 20 miles around will not grow crops for decades to come and the Indian farmers must eventually be resettled elsewhere.

Science News Letter, May 13, 1944

MEDICINE

Mold Put Into Body

New kind of penicillin treatment consists of injection of the hyphae themselves. Tests on humans and animals show quick results with no bad reaction.

➤ A NEW and apparently better way of using penicillin, putting part of the mold itself directly into the body where it goes on producing its anti-germ chemicals, is suggested in a report by Dr. H. E. Enoch and Dr. W. K. S. Wallersteiner, of London, in a report to the scientific journal, *Nature*. (March 25)

No harmful effects resulted in animals or humans from this method of using penicillin, the scientists report. The response to treatment is prompt, usually within three or four hours after the first injection. Fever dropped and there was immediate relief of pain in the trials on laboratory animals.

Results have already been obtained in human cases of pneumonia that failed to respond to sulfa drugs, and in acute staphylococcal, streptococcal and other infections.

In most of the animal cases one or at most two injections of the material were enough to completely clear an infection. Penicillin itself is rapidly eliminated from the body via the kidneys, which has necessitated giving frequent and usually large doses in order to have enough of it in the body to fight the invading germs. It may have to be given as often as every three or four hours. One injection of the living mold material, however, has an effect that appears to last for 36 to 48 hours.

The material used is a suspension in fluid medium of the hyphae, or filaments, of the mold. They are taken from below the mycelium, or mat of mold filaments, on top of the culture at the stage of its highest rate of penicillin production.

The material is freed of fever-inducing substances and other impurities and is equally efficient whether injected into the veins or the muscles. It seemed "exceptionally potent" when used in treating open wounds with mixed, fever-causing infections.

The effects of this material in checking infection, the scientists believe, are due not only to penicillin, which the mold goes on producing in the body, but to the presence or production of other anti-germ chemicals which are destroyed or left behind in penicillin manufacture.

In 21 cases of animal infections, positive results were obtained in 14. There was some doubt about three cases and four others failed to respond. Even when the living mold material was injected directly into the animal's veins, no harm resulted.

The infections which responded to treatment were gastro-intestinal (the colon bacillus), staphylococcal, streptococcal and pneumococcal. Virus infections did not respond to the treatment.

Science News Letter, May 13, 1944

CHEMISTRY

Anti-Bleeding Vitamin Receives U. S. Patent

➤ VITAMIN K, the anti-bleeding vitamin, is now covered by U. S. patent 2,348,037, issued to the group of five scientists who first isolated the compound in pure form, determined its chemical structure, and duplicated it synthetically in the laboratory. Rights in the patent have been assigned to St. Louis University, and any proceeds from licenses to manufacture it commercially will be plowed back into scientific investigation. The five-man

SCIENCE NEWS LETTER

Vol. 45 MAY 13, 1944 *No. 20*

The weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington 6, D. C. NORTH 2255. Edited by WATSON DAVIS.

Subscriptions—$5.00 a year; two years, $8.00; 15 cents a copy. Back numbers more than six months old, if still available, 25 cents.

Entered as second class matter at the postoffice at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and in the Engineering Index.

The New York Museum of Science and Industry has elected SCIENCE NEWS LETTER as its official publication to be received by its members.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., PEnnsylvania 6-5566; and 360 N. Michigan Ave., Chicago, STAte 4439.

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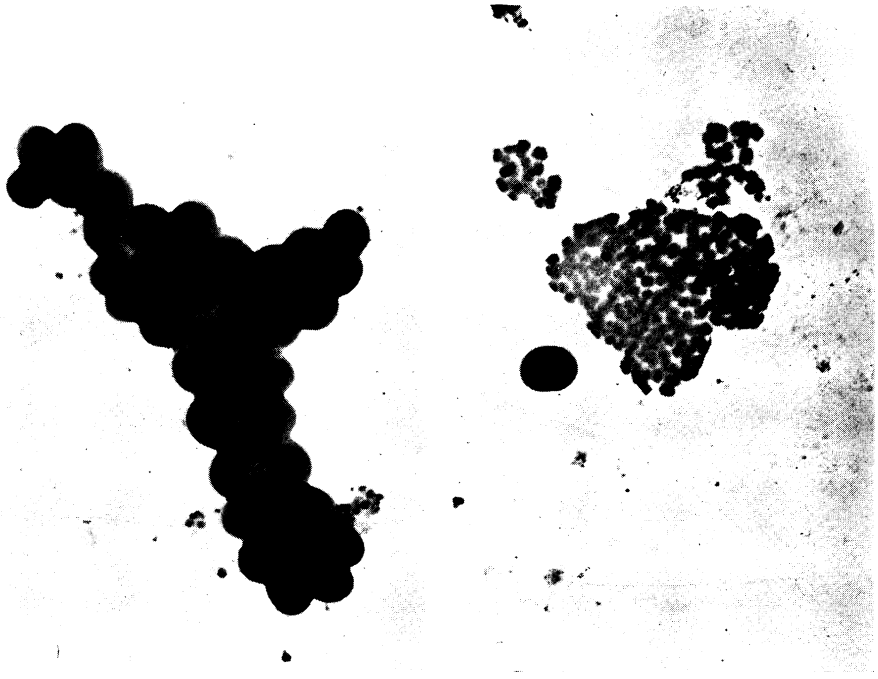

PENICILLIN IN ACTION—The first photographs to reveal the effect of the mold chemical on disease-causing bacteria, these micrographs show the bacteria Staphylococcus aureus magnified about 19,000 times with the electron microscope. The bacteria is shown (left) as a grape-like cluster before penicillin is introduced and (right) after penicillin has affected the germs.

research team who are listed as patentees are Dr. S. A. Thayer, Dr. S. B. Binkley, Dr. R. W. McKee, Dr. D. W. MacCorquodale and Dr. E. A. Doisy, all of the staff of St. Louis University Medical School.

The name "vitamin K" has been used only as a convenience; spelled out in full chemical longhand the substance is 2-methyl-3-phytyl-1,4-naphthoquinone. It can be obtained from plant substances as a natural source (the inventors mention alfalfa), or it can be made synthetically with coal tar as the original starting point.

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BACTERIOLOGY

Phage Against Dysentery

One ultramicroscopic bacteriophage particle will protect mice against eight virulent dysentery germs. Is unique among germ-eat-germ substances.

➤ UNIQUE among the antibiotic or germ-eat-germ substances, of which penicillin is the present champion, is bacteriophage, Dr. Harry E. Morton, of the University of Pennsylvania School of Medicine, told members of the Society of American Bacteriologists at their New York meeting.

The unique feature of bacteriophage is that as it is used to destroy virulent germs in the body more of the active phage is generated.

One ultramicroscopic phage particle will protect mice against eight virulent dysentery germs, Dr. Morton and associates, Frank B. Engley, Jr., and Juan Enrique Perez-Otoro, found. In one experiment, all mice survived 12,000 minimum deadly doses of dysentery germs when at the same time they were given one cubic centimeter (about a fourth of a teaspoon) containing about 50 billion particles of phage active against these germs.

When used as a treatment for dysentery, the phage had to be given within a few hours of the infecting dose of germs. When, however, the phage was given one, three, five or six days before, the mice survived about 10,000 minimum killing doses of the germs.

Bacteriophage, discovered many years ago by French scientists, is believed by some to be a living organism or virus that preys on other, larger germs. Other scientists believe it is a non-living substance like an enzyme or ferment. It destroys its germ victims by a process called lysis or dissolution.

The protective action of the phage in the body is related to this lysis which can be observed in the test tube, Dr. Morton and associates reported. Unless there is lysis of the germs in test-tube experiments, there will not be any immediate protective action in the animal body. Test-tube experiments alone, however, are not sufficient for evaluating the effect of the substance in the body, Dr. Morton pointed out. Even the sulfa drugs and penicillin would have been misjudged if they had been evaluated on the basis of test-tube experiments alone.

The conflicting scientific opinions of bacteriophage resulted, apparently, from the fact that early reports were based on test-tube experiments or on inadequately controlled trials in animals. The Pennsylvania experiments were planned to give more adequate knowledge for evaluating bacteriophage which, on the basis of today's report, appears as an effective weapon against dysentery, at least in mice.

Science News Letter, May 13, 1944

New Micrographs Shown

➤ THE FIRST PICTURES showing penicillin in action against disease germs were shown by Dr. V. K. Zworykin, Dr. James Hillier and Perry C. Smith, of the Radio Corporation of America, at the meeting.

The pictures were made with the electron microscope, which uses a concentrated beam of electrons instead of light and a system of "magnetic lenses" to show objects 100 times smaller than can be seen even with the most powerful optical microscopes.

Staphylococci, life-threatening invaders of war wounds as well as the cause of boils and food poisoning, appeared first as large grapes in the greatly magnified electron microscope pictures. Then they were seen to shrivel under